ABSTRACT

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The Incidence of Shipping Costs in International Trade

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As a result of the dependences of the Association of Southeastern Asian Nations (ASEAN) on other shipping services which are mainly subjected to liner conferences, three problems have been brought about as follows. Firstly, from the analysis of the balance of payments, freight and insurance account, it is evident that the balance of payments of ASEAN is strained by large freight payments. Secondly, the problems arise from the behavior and practices of liner conferences. However, since this problem consists of many allegations or complaints which transcend the scope of this study, it is excluded. Thirdly, it concerns the heavy incidence stemming from the relatively high conference rates and the peculiarity of each commodity in international trade.

The principal objective of this study is to verify whether or not ASEAN bears the burden of shipping costs of the selected commodities on both their exports to and imports from the U. S. This is the above third problem which is carried out by using the econometric technique in estimating the import demand and export supply price elasticities.

Identification of the said burden follows exactly the same laws which determine the shifting and burden of taxes on commodities. The empirical result of the country-by-country study indicates that a definite conclusion cannot be drawn. The reason is, on the one hand, the number of the selected commodities for import and export may be too few to draw an overall conclusion of each country. On the other hand, unsatisfactory cases for each country and commodity are too numerous. (Satisfactory cases refer to the cases where both supply and demand price elasticities have the correct signs.) However, in the case of ASEAN as an importer and the U. S. as an exporter, four commodities out of fifteen were significant at ten percent tolerance level. It showed that the ASEAN importer can bear the shipping costs, and the U. S. exporter can bear the costs in one commodity. Also, in the case of ASEAN as an exporter and the U. S. as an importer, four commodities out of fifteen were statistically significant at ten percent tolerance level. It showed that in three cases the American importer bore the shipping costs, and in one case an ASEAN country (Indonesia) bore the shipping cost when exporting (tin) to the U. S. A.

This study also presents the detailed information on the ASEAN position in international shipping industry, including the characteristics of shipping markets, services and freights.

THE INCIDENCE OF SHIPPING COSTS IN INTERNATIONAL TRADE

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CHAPTER I

INTRODUCTION

Statement of the Problems and Their Significance

The importance of transportation is well recognized. Among means of conveyance in international trade, ocean transportation or shipping stand out as the most important. Wars have been fought for access to water trade routes and, for any country dependent on trade, ocean transportation is of vital importance. A problem presents itself, in as much as, through historical development, dependence on ocean shipping and ownership of tonnage do not always coincide. While most countries in the world are, to some degree, dependent on shipping, the major part of shipping is services provided by some traditional maritime nation.

As far as shipping is concerned the dependence on third country service is the vital problem of the developing countries. The great disparity that exists is between the amount of cargo capacity required to transport goods to and from developing countries and that actually owned and operated by these nations. However, the immediate effect of this is a deficit on their balance of payments, freight and insurance account.

The most important question is who ultimately bears the shipping costs. The reply to this question can be phrased as follows: it depends on what commodity is being dealt with and the position of the commodity in the international trade market. Take, for example, crude

oil, which is mainly supplied by OPEC countries and distributed by several major oil companies. The tanker freight expenses are usually paid by these distributors in two ways: firstly, the form of operational expenses if they use their own tank-ship; secondly, in the form of charter freight expenses in case they do not use their own carriers. The importing countries must pay more than the posted price of crude oil. Tanker rate (for all sizes of carriers) increases all the time.[1] When OPEC announces the increase of the posted price, the difference between the initial and the increased level of the price paid by importers seldom coincide. Thus, if the price paid by importers covers the posted price and all the freight cost, the importers bear all the incidence. But if it covers only the posted price and some part of the freight costs, the incidence is shared by both the distributors and importers. This implies that the party paying the freight bill is not necessarily the one who bears the shipping costs. By this structure of problem there exists the ground of complaint that the developing countries always bear the burden of freight costs on both their exports and imports.

Moreover, the dependence of developing nations on third countries for shipping services has created additional important problems concerning the structure and operation of world shipping. To a great degree, the focus of the criticism on the part of the developing countries has

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[1]United Nations Conference on Trade and Development (UNCTAD), Review of Maritime Transport [New York, U. N. (Document) TD/B/C.4.] various issues.

been directed at the operation of the liner or the shipping conference system which handles most of the non-petroleum products trade between developing and developed countries.[2]

Stated simply, a liner conference is an unincorporated association of ocean liner owners who have joined together in agreement to regulated competition among members, and prevent competition as far as possible from outside sources.[3] The features of the conference system will be discussed in detail in Chapter II.

Since liner conferences do have a varying degree of control over the routes they service, this had led to a number of specific complaints concerning discrimination in terms of prices and service. For example, developing countries have charged that the operations and level of rates imposed by the conference lines of traditional shipping nations deliberately favor their own exporters, or those of other industrial countries to the detriment of the developing countries. In related complaints, the developing countries have charged that, due to the monopoly position, the conferences have been able to achieve unduly high profits on freight carried between developing and developed countries, profits which unfavorably influence the export performance and industrialization prospects of the developing countries.[4]

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[2]P. J. Richards, "Shipping Problems of Underdeveloped Countries," Oxford Bulletin of Economics and Statistics, Vol. XXIX (August, 1967), p. 267.

[3]B. M. Deakin and T. Seward, Shipping Conferences (Cambridge: Cambridge University Press, 1973), p. 1.

[4]A. J. Yeats, Trade Barriers Facing Developing Countries (New York: St. Martin's Press, 1979), p. 259.

Aside from the level of conference charges, rate structure comes in for frequent criticism. Allegations have been made that conference rates favor the export of primary goods from developing countries at the expense of semi-finished or manufactured products.[5] This rate structure has serious detrimental effects on the industrialization objective. Another complaint suggests that the calls for establishment of promotional rates for manufactures or new export ventures are often ignored by conferences with the result that developing countries feel these organizations are insensitive to national development objectives.

Alleged discrimination against ports, or against incoming as opposed to outgoing traffic, has also been a source of numerous complaints against the liner conference.

Thus, the problem of developing nations concerning shipping services can be classified as follows: Firstly, the balance of payments is strained by large freight payments. Secondly, shippers in developing countries inevitably bear the major part of incidence stemming from maritime costs due to the peculiarity of each commodity in international trade. Thirdly, the problems arise from the organizational characteristics of international shipping industry, especially the liner conference system.

Objective and Scope of the Study

This study attempts to investigate the above first and second problems which may occur in ASEAN countries. As regards to the third

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[5]T. Marray, Trade Preferences for Developing Countries (New York: MacMillan Press, Ltd., 1977), p. 154.

problem, since it consists of many allegations or complaints which are enormous matters, each of which requires a particular study, it is excluded from this study. The first problem can be assessed directly from the balance of payment, freight and insurance account.

The principal objective of this study is to verify whether or not ASEAN bears the burden of maritime costs on both exports and imports from the U. S. A. This is the second problem which is closely related to the elasticities of the response of trade to the changes in prices of each commodity concerned. This study also aims at identifying and describing the ASEAN position in international shipping industry. This includes detailed information on various kinds of shipping market services and freights.

Finally, some policy measures are brought up for discussion and evaluation.

Organization of this Thesis

Chapter II is a review of literature. It briefly discusses some empirical studies on the structure of the shipping market, the incidence of transport costs and the freight structure. Also, this chapter contains the economic background concerning the meaning of shipping and liner conferences. The balance of payment, freight and insurance account of each ASEAN nation will be analyzed concisely in this chapter.

Chapter III provides the models used in this study with the conceptual framework behind it, detailed description of how measurement is carried out, definitions of the variables, commodity coverage and source of data.

The core of the analysis is given in Chapter IV where the econometric results and their economic interpretations are discussed at length. In addition, some policy implications are presented.

Finally, Chapter V contains the conclusion of the analysis and pertinent remarks.

CHAPTER II

REVIEW OF LITERATURE

Transport Costs in Economic Study

Economists have long been interested in the role of transport costs in international trade. Over the years, a large body of literature has been developed regarding the theoretical aspects of transport costs while numerous applied studies have attempted to ascertain their quantitative importance. In the area of quantitative analysis, interest has been found on the role of transport costs in influencing the pattern of international trade flows. The problem faced by all researchers has been the lack of data on the incidence of national transport costs. Detailed transport costs data exists for specific commodities trade on specific routes. The problem has been to locate data indicating national transport costs.[6]

In response to this, most economists have adopted "distance" as a proxy variable to represent transport costs. But the interpretation of "distance" differs from study to study.

In 1962, for example, Tinberger[7] proposed and tested empirically an economic model in which the size of the bilateral trade flows between countries was expressed as a function of a variety of variables, one of

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[6] G. P. Sampson, "An Analysis of the Source of Inter-Country Differences in International Transport Costs," Revista Dell Instituto Di Economic Internazionale, Vol. XXXI (August-November, 1978), p. 234.

[7] J. Tinberger, Shaping the World Economy (New York: Twentieth Century Fund, 1962).

which was international transport costs (he adopted distance as a surrogate variable) and he found it to be a positive and significant barrier in inter-country trade flows.

Linneman[8] gave distance as a "natural resistance factor" reflecting not only transport costs, but also time in transit, and what Beckerman[9] had earlier referred to as "psychic distance." Beckerman used this term to refer to factors such as language differences (or similarities) which may lead an exporter to consider a market to be further (or nearer) than an alternative. Linneman also found "distance" to be an important impediment to international trade.

However, Kindleberger[10] indicated that distance is only one of many factors which influences transport costs. In fact, there has been little empirical evidence of what determines national transport costs. One of the few pieces of research in this regard has been made by Moneta[11] whose study invetigated the relationship between the total cost incurring in shipping the goods from the country of production to the country of consumption. The analysis is aimed at solving a problem of international trade accounting which the conversion procedure

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[8]H. Linneman, An Economic Study of International Trade Flows (Amsterdam: North Holland Publishing Company, 1956).

[9]W. Beckerman, "Distances and the Pattern of Intra-European Trade," Review of Economics and Statistics, Vol. XXXVIII (February, 1956).

[10]C. P. Kindleberger, Foreign Trade and the National Economy (New Haven: Yale University Press, 1962), p. 11.

[11]C. Moneta, "The Estimation of Transport Costs in International Trade," Journal of Political Economy, Vol. LXVII (February, 1959), pp. 41-58.

of c.i.f. value of f.o.b. value, and vice versa, has been seriously doubtful. In principle, the difference between c.i.f. and f.o.b. trade values represents the costs of freight and insurance. However, due to notorious measurement errors, these figures cannot be used in traditional econometric procedures. Moneta regressed freight rate on unit value and "distance factor" of German imports from the partner regions in 1951. From this procedure he obtained freight factors which can be used as a c.i.f./f.o.b. conversion factor. The result also indicated: (1) that freight rates tend to vary positively with unit value, but so much more slowly that freight factors vary inversely with unit values; and (2) that freight rates also positively correlated with the distance parameter.

One of the most recent empirical studies where the data of national transport profiles is inconsistent is that of Gerachi and Prewo.[12] In this paper the f.o.b. and c.i.f. differential values for exports are used to approximate transport costs between OECD countries. This study examined the direction and level of aggregate bilateral trade flows in a multi-country trade network. This study therefore incorporate economic variables for both importing and exporting countries, including demand and supply conditions and "trade resistance factors," in particular, the costs of transportation. The latter are incorporated into the analysis through an errors-in-variables specification (generalized least squares procedure). The results indicated that the use of the mere distance as

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[12] V. J. Gerachi and W. Prewo, "Bilateral Trade Flows and Transport Costs," Review of Economic and Statistics, Vol. LIX (February, 1977), pp. 67-74.

a proxy transport cost may result in a serious underestimation of the sensitivity of bilateral trade flows to transport costs.

Economic Organization

There are plenty of publications in the field of ocean transportation but a complete survey of the writings in this field would be too time-consuming to be feasible or justified. However, some studies have proven particularly useful. Marx[13] presented a great deal of factual information on shipping conferences in his book. He constitutes early exhaustive investigations into the economic consequences of shipping cartels. The general conclusion is that dependable and regular services necessitate shipping conferences and the benefits of such service outweigh any disadvantages inherent in conference monopoly power.

Grossman[14] provided, in his monography, a thorough picture of shipping organization and a theoretical treatise on rate setting principles. He gave a detailed account of the rate making characteristics of commodities, trade values and ports. The very important point in this monograph is the finding that the conference rates reflect a case of price discrimination based on different elasticities of demand for the service provided. In addition, Grossman noted the close cooperation among conferences that have overlapping or similar interests.

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[13] D. Marx, Jr., International Shipping Cartels (Princeton: Princeton University Press, 1953).

[14] W. L. Grossman, Ocean Freight Rates (Cambridge: Cambridge University Press, 1956).

Thorburn[15] developed a general theory of price setting in water transportation and took into account distance, structure of ship and ports, different demands of shippers and different types of goods. He considered conferences as oligopoly rather than monopoly because the behavior of the conferences always allows for the possibility of outside competition if freight rates are kept too high. The oligopoly situation of the conferences has resulted in a policy of rate setting that is not dictated primarily by cost considerations. The reactions from shippers and carriers outside the conferences are also taken into account. This leads to the conclusion that the rates are not set on the principle of "cost of services," but rather on "what the traffic will bear."

Melachlan's[16] study focused on the price policy of liner conference and took into consideration some of the factors affecting the general level of liner freight rate. This study combined the industrial organization principles and the experiences of some of the liner conferences serving the outward and homeward trades of the United Kingdom in assessing the price policy.

In conclusion, he summarized the main factors influencing the determination of the general level of liner freight rates as follows.

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[15]T. Thorburn, Supply and Demand of Water Transport (Stockholm: Business Research Institute at Stockholm School of Economics, 1960).

[16]D. L. Melachlan, "The Price Policy of Liner Conferences," The Scottish Journal of Political Economy, Vol. C, No. 3 (November, 1963), pp. 323-335.

In a situation in which fixed costs predominate and total costs are not easily allocatable among the various commodities moving in a given trade, stability of freight and service are unlikely to be provided except by the emergence of either a single firm monopoly or a collective monopoly. Also, for any British liner company, however, whether part of one of the large groups or a smaller independent enterprise, price policy is very much conditioned by the traditional mores of the industry.

Shipping Problems Facing Developing Countries

There are many studies on shipping published by the United Nations Conference on Trade and Development (UNCTAD).[17] However, only two of these studies will be mentioned here. One deals with the problems of shipping in terms of developed and developing countries in general while the other is confined to Southeast Asia.[18] Both studies reach a similar conclusion. Both stress the heavy reliance of developing countries; the importance of consultative machinery between shippers and carriers; the importance of port improvements; the desirability of building national merchant marines and the potential favorable effect that such tonnage would have on the balance of payments.

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[17]For example, these studies are: United Nations Conferences on Trade and Development (UNCTAD), Level and Structure of Freight Rates, Conference Practices and Adequacy of Shipping Services (TD/B/C.4/38/Rev. 1), New York, 1969; UNCTAD, Relationship between Changes in Freight Rates and Changes in Costs of Maritime Transport and the Effect on the Export Trade of Developing Countries (TD/B/C.4/112), Geneva, 1973a.

[18]UNCTAD, Ocean Shipping and Freight Rates and Developing Countries, Financing and Invisibles, Institutional Arrangements, Vol. V (E/Conf. 46/141), New York, 1964. And UNCTAD, "Problems of Shipping and Ocean Freight Rates in the ECAFE Region," Financing and Invisibles, Institutional Arrangements, Vol. V. (E/Conf. 46/141), New York, 1964.

In the area of quantitative analysis, remarkably little attention has been directed to the assessment of the influence of transport costs on the exports and imports of developing countries. While most previous empirical studies aimed at evaluating trade barriers have focused on artificial trade control measures such as tariffs quantitative restriction, etc., transport costs pose a formidable restraint on some items. The neglect of transport costs may have been due to lack of available data as mentioned earlier, or to the assumption that these charges are exogenous variables outside the direct control of policy makers. Another reason for the neglect may have been the presumption that the influence of transport costs, relative to tariffs or other nontariff barriers, is generally small.

Recent studies have indicated that many of these views in regard to transport costs will have to be altered. For example, Finger and Yeats, using a special United States Census Bureau Tariff Commission Sampling, demonstrated that "whether measured in terms of nominal or effective rates, transport costs pose a barrier at least equal to post-Kennedy round tariffs most favored nation (MFN) in the United States. And like effective tariffs, effective transport costs appear to increase with the stage of processing."[19] Furthermore, this study reveals that the incidence of shipping costs is higher on goods exported by developing countries than developed nations' exports.

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[19]J. M. Finger and A. J. Yeats, "Effective Protection by Transportation Costs and Tariffs: A Comparison Magnitude," Quarterly Journal of Economics, Vol. XC (February, 1976), pp. 169-176.

However, the incidence of transport costs on imports has received very little attention. There is no empirical study on this matter, even though UNCTAD discussed and provided theoretical analysis many years ago. UNCTAD concluded in 1969 that, whoever pays initially, the ultimate burden of freight rates fall disproportionally on the developing countries for both exports and imports.[20]

Nevertheless, Laing[21] incorporated the effects on commodity prices and quantities sold in the market, and argued that this view is over-simplified. This is mainly because it does not follow up the connection between freight rates and market prices on the one hand, and volumes sold in the commodity markets on the other. He concluded that when that point is taken into account, the developing countries do not necessarily bear the burden of freight rates. No such generalization is justifiable. The critical factor determining the incidence is the elasticity of supply of the country with regard to its freight rate relative to those of competitors, which could take any value.

Meaning of Shipping

The basic functions of transport involving economic, social or military needs are the creation of utilities of place[22] and of time.[23]

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[20]United Nations Conference on Trade and Development (UNCTAD), Level and Structure of Freight Rates, Conference Practices and the Adequacy of Shipping Services (TD/B/C.4/38 Rev. 1), New York, 1969.

[21]E. T. Laing, "Shipping Freight Rates for Developing Countries: Who Ultimately Pays?" Journal of Transport Economics and Policy, Vol. XI (September, 1977), pp. 262-276.

[22]D. P. Locklin, Economics of Transportation (Homewood: Richard D. Irwin, Inc., 1972), p. 4.

[23]M. L. Fair and W. Ernest William, Jr., Economic of Transportation (New York: Harper Brothers, 1950), p. 3.

Utilities of place occur when the goods are carried from places where their utility is low to places where it is higher. An obvious example is the carriage of oil from Kuwait, where the value of obtaining a little more oil is relatively low, to the United Kingdom, where the value of oil at the oil refinery is correspondingly higher. As regards to time ultilities, they come about simultaneously for two reasons. Firstly, the production of many commodities cannot take place at any time of the year, such as agricultural products. Thus, an inventory as well as effective transportation are required in order to fill the successive demands in the nonproducing period of the year. Secondly, speed of conveyance is considerably important, especially in the emergency or carriage of perishable goods.

All sea areas in the world are common fields of activity for all ships in the world. Consequently, shipping is one of the few industries guided by a set of international rules as well as various conventions and established practices. Today most ships are built in accordance with classification society rules so as to ensure safety and the best possible performance in commercial operations throughout the world.[24] Ship documents, shipping forms and contracts of affreightment are uniformly used by all maritime countries. Moreover, the English

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[24]Classification societies such as Lloyd's Register of Shipping, Bureau Veritas, American Bureau of Shipping, Norske Veritas, Polski Rejestr, Registro Italiano, Germannischer Lloyd exist primarily for the purpose of surveying and classifying the mercantile marine of every nationality. This information is usually disseminated through the medium of publications containing particulars of all seagoing vessels. For more details see Alan E. Branch, The Elements of Shipping, 3rd edition (London: Chapman and Hall Ltd., 1977), pp. 16-17.

language is accepted as the "lingua franca"[25] in commercial and technical operations of ships around the world.

People who carry goods by sea can all be said to be carrying on shipping activity. But shipping in its true meaning is being done only as a part of the international commercial activity. Historically, the international commercial activity consisting of purchasing of goods in overseas regions to be sold in other regions by means of sea transport includes not only commerce and shipping but also finance and insurance. Thus, international merchants at the middle of the nineteenth century had to have their own private carriers and they rarely committed the carriage of goods to other persons. The integral activity described above should be designated as marine commerce rather than shipping. However, it was only in relatively recent times that shipping activity became independent of the marine commerce. An evolution process from private carrier to common carrier in the middle of the nineteenth century was based on accomplishment of the industrial revolution on one hand and the advancement of technology in ship engineering and navigation on the other.[26]

However, there has been a tendency toward reviving the private carrier. Large industrial or trading companies have appeared to carry their own cargo by themselves as a link of their production

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[25]D. Koludrovic, "Shipping Today and Tomorrow," Shipping and Ocean Freight Rates: Training Course in Shipping Economics and Administrative Policy (Bangkok: ECAFE, 1970), p. 56.

[26]T. Shimojo, Economic Analysis of Shipping Freights (Kobe: Kobe University Press, 1979), pp. 5-6.

process. The specialized or purpose vessels are built to meet the demand for a particular trade such as fruit, meat, lumber and even gas. Some of these vessels are owned and operated by producers of the corresponding products. The most obvious example of this tendency is the use of tankers which are built for the purpose of hauling crude oil or refined products between the points of origin and the consumer markets.

Though the tendency cannot be neglected, it should be analyzed as a part of the production process of a particular firm (in the case of "industrial carrier"). However, specialized (or purpose) vessels or tankers which are hired under short-term or long-term contracts at fixed or variable rates can be considered as a common carrier and, certainly, as industry.

Thus shipping is, at the present time, completely independent of the marine commerce and,

> In any way, an industry specialized only in the sea transport. . . . In the contemporary meaning, the shipping industry is nothing but an industry that produces the services named as sea transport and that sells them to other industries for the freight.[27]

Liner Conference

Liners are for the most part engaged in the package freight trades, which consists of semi-bulk and general cargo. The shipping conference is undoubtedly the dominant feature of liner shipping because conference

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[27]T. Shimojo, Economic Analysis of Shipping Freights (Kobe: Kobe University Press, 1979), p. 9.

members handle approximately ninety-five percent of the world's general cargo and semi-bulk trade.[28] The remaining five percent is handled by tramp vessels on irregular schedules. There are approximately five hundred shipping conferences in the world.[29] About sixty conferences operate in and out of ASEAN.[30]

Shipping conferences are associations of owners of freight liners.[31] These owners join together in working out a common price for the carriage of goods over the defined routes on which the conferences operate. They also act in combination to admit or exclude applicants to conference membership, to share the trade in various ways among themselves, to make a common policy on such matters as setting the levels of shippers discounts and rebates combatting competition from nonmembers, pooling and sharing earnings, and enforcing these and other agreements which conference members have made with each other.

What has been outlined above is the "closed" type of conference. New members can join "closed" conferences only with the consent of

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[28]P. J. Richards, "Shipping Problems of Underdeveloped Countries," Oxford Bulletin of Economics and Statistics, Vol. XXIX (August, 1967), p. 267.

[29]Arthur D. Little, Inc. and Associated Consultants, Southeast Asian Regional Transport Survey, a research project prepared under the requirement of Asian Development Bank (Singapore: Asian Development Bank, 1972), Book 2, Part II, p. 200.

[30]Ibid., p. 204.

[31]UNCTAD, Level and Structure of Freight Rates, Conference Practices and Adequancy of Shipping Services (TD/B/C.4/38/Rev. I), (New York: United Nations, 1969).

existing members. "Open" conferences may be joined by an shipowner without the consent of existing members provided that the shipowner who joins can meet the criteria laid down by the Federal Maritime Commission.[32] Both of these types of conferences exist today on different routes in various parts of the world. The "closed" conference is more common. The "open" conference prevails chiefly on routes which connect the United States with other parts of the world.[33] In both types of conferences a commonly agreed tariff of rates of freight is normally charged.[34]

The aspect of shipping conferences which is perhaps of greatest interest to an economist is the vast mechanism of administered prices. The conferences are "price makers" on an enormous scale. In the United Kingdom-Australia Conference, for example, there are an estimated 7,125 commodities in the freight tariff, and they are located into a range of one hundred and fifty separate prices and price classes.[35]

Liner conferences dominate the general cargo and semi-bulk trades of ASEAN. For example, the Far Eastern Freight Conference (FEFC), composed of over twenty shipping lines, control around eighty percent of the seaborne freight moving on the Far East to Europe route.[36]

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[32]Deakin and Seward, op. cit., p. 1.

[33]R. O. Goss, "U. S. A. Legislation and the Foreign Shipowner: A Critique," Journal of Industrial Economics (November, 1963), reprinted in R. O. Goss, Studies in Maritime Economics (London: Cambridge University Press, 1976), p. 25.

[34]Deakin and Seward, op. cit., p. 1.

[35]Ibid., p. 2.

[36]G. Lauriat, "Liner Shipping: Containerization is Now Much More Effective," Fareastern Economic Review (February 9, 1979), p. 35.

Liner conferences trades of the region are dominated, as are most conferences in the world, by European, Japanese and U. S. firms. Most of the conference shipping is handled by third flag operators. Although regional shipping companies are, for the most part, members of conferences, less than ten percent of the companies in conferences which trade in ASEAN are shipping companies based in the region.[37]

The introduction of container ships is causing a considerable change in the structure of conferences which may become more widespread in the future. Containerization requires a very large capital. Whereas a modern general cargo vessel of 30,000 d.w.t.[38] may cost $6 to $7 million, a container ship of the same size built in Japan at mid-1970 prices may cost $20 million, exclusive of the containers, a set of which costs around $3 million.[39] Container shipping also requires the introduction of a system to tract the containers. This involves a vast computer system.[40] Moreover, container shipping requires special handling facilities as well as a system of operating and managing at port. Consequently, containerization necessitates coordination between the ship and the containers, and this has led large shipping companies to band together in the form of container

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[37]Arthur D. Little, Inc. and Associated Consultants, loc. cit., Book 2, Part II, p. 180.

[38]Deadweight Tonnage (d.w.t.) express the number of tons a vessel can transport of cargo, stores and bunker fuel.

[39]Arthur D. Little, Inc. and Associated Consultants, loc. cit., Book 2, Part II, p. 200.

[40]Alan E. Branch, The Element of Shipping, 3rd edition (London: Chapman and Hull Ltd., p. 1977), p. 186.

consortium, which represents a fundamental change in the organization of shipping industry.[41] For example, the British have formed the Overseas Container Lines group (OCL), which operates on the Europe-Japan route, calling at Singapore and Hong Kong, the Atlantic Container Line (ACL), which operates between Northern European ports and the North Atlantic ports of the United States. However, most U. S. container ships at present operate independently of the consortia, especially the SEALAND which has no need for consortia arrangements.[42]

The Balance of Payment, Freight and and Insurance Account of ASEAN

Transportation and transport insurance are invisible items which can be classified in the service category. They create two-way transactions, i.e. exchange of transport and insurance services of one against freight and premium charges of the other country.[43] Therefore, freight and insurance account is contained in the current account of balance of payments.

The freight and insurance account of the balance of payments of ASEAN, 1970-1977, is summarized in Table 1. The account consists of two entries: a debit and a credit. Freight and insurance debit represents payment to nonresident carriers and insurers. The sum of this column and of import f.o.b. column does not necessarily equal

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[41]Arthur D. Little, Inc. and Associated Consultants, loc. cit., Book 2, Part II, p. 201.

[42]Ibid., p. 213.

[43]M. Chacholiades, International Monetary Theory and Policy (New York: McGraw-Hill, Inc., 1978), p. 39.

imports c.i.f., the difference being freight and insurance paid to residents. Freight and insurance credit consists of payments from abroad for freight and insurance, including payment relating to trade between foreign countries.

From Table 1, it is evident that each ASEAN country faces deficit in the freight and insurance account of the balance of payment. Even if Singapore is considered as one of the most progressive shipping countries in the world, she is still confronted with deficit in this account.

On the debit entry, it is obvious that each ASEAN country paid over one hundred million U. S. dollars of foreign exchange per year for shipping and insurance services. It is also shown that the costs of these services for each country increased more than threefold during the period of 1970-1977. Indonesia is the greatest buyer of shipping service of ASEAN with her expenses increased over ninefold. Shipping expenses of Singapore, Thailand, Malaysia and the Philippines increased sevenfold, fivefold, fourfold and threefold over the considered period respectively.

Concerning the percentage changes of the debt side, it appears that Indonesia, Singapore and Thailand have positive values in percentage increases throughout the period of 1970-1977 with the average values of 35.7, 27.0 and 22.4 percent respectively. As for Malaysia and the Philippines, there appeared fluctuation in values of freight and insurance depletion as represented by the changing signs of percentage changes. However, the maritime costs of Malaysia and the Philippines

have increased in value from 1970 onward with the exception of Malaysia in 1975 and the Philippines in the years 1971, 1975 and 1976 when a negative sign was recorded. Nevertheless, on the average there exist positive values of 25.3 percent and 22.7 percent for Malaysia and the Philippines respectively.

According to the values of freight depletion and their average percentage increases, the role of each ASEAN country as an importer of shipping service can be arranged in order of importance as follows: Indonesia, Singapore, Thailand, Malaysia and the Philippines.

On the credit entry, it is evident that Singapore is the greatest exporter of shipping service of ASEAN due to her relatively greater revenue from this activity. Concerning the percentage changes of the credit side, it is apparent that (apart from Indonesia which has no figures on the credit entry) Malaysia, the Philippines, Singapore and Thailand have positive values in percentage increases throughout the period of 1970 to 1977, with the average values of 80.4, 33.9, 61.5 and 30.9 percent respectively. With regard to Singapore, the percentage changes of the credit side appear to have positive values throughout the period considered. This means that the role of Singapore's fleet has prominently increased in both her own trades as well as her cross-trades.[44] Aside from Singapore, three other ASEAN countries showed fluctuations in values of revenue earning from shipping activity

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[44]Cross-trade is a kind of activity which one country, so-called the cross-trader, participates in the carriage of goods between two or more other countries. The major cross-traders are, for example, The United Kingdom, Norway, Holland, Japan and West Germany.

as represented by changing signs of percentage changes of Malaysia in 1975, the Philippines in 1971, 1972, 1975 and Thailand in 1975.

According to the values of revenue earning from shipping service and their average percentage increases, the role of each ASEAN country as an exporter of shipping service can be arranged in order of importance as follows: Singapore, the Philippines, Malaysia and Thailand.

Having examined the freight and insurance account of the balance of payments, the conclusions that emerge are: firstly, ASEAN is a large importer of shipping services; secondly Singapore is considered to play the greatest role in shipping activity among ASEAN countries, while Malaysia and the Philippines have attained relatively the same level. As for Thailand and Indonesia, they are considered to bring up the rear among this group of countries.

TABLE 1

BALANCE OF PAYMENT, FOREIGN AND INSURANCE ACCOUNT OF ASEAN, 1970-1977

Unit: Million U. S. $

Country	Year	Imports of goods (f.o.b.)	Freight and Insurance			
			Debit		Credit	
			Value	Percentage Changes	Value	Percentage Changes
Indonesia	1970	1116.0	142.0	---	---	---
	1971	1229.7	148.4	4.5	---	---
	1972	1445.1	166.1	11.2	---	---
	1973	2663.2	302.8	82.2	---	---
	1974	4633.8	596.5	96.9	---	---
	1975	5468.5	724.8	21.5	---	---
	1976	6818.6	890.1	22.8	---	---
	1977	7473.3	984.2	10.5	---	---
Malaysia	1970	1291.0	101.0	---	2.0	---
	1971	1375.1	109.3	8.2	3.0	50.0
	1972	1550.4	121.6	11.2	11.9	296.6
	1973	2319.9	195.5	60.7	23.8	100.0
	1974	3885.7	328.3	67.9	31.8	33.6
	1975	3470.0	287.8	-12.3	27.9	-12.2
	1976	3764.9	334.8	16.3	49.6	77.7
	1977	4519.5	420.3	25.5	58.4	17.7
Philippines	1970	1090.0	107.0	---	29.0	---
	1971	1185.5	102.3	-4.3	20.1	-30.6
	1972	1260.5	109.7	7.2	13.0	-35.3
	1973	1596.3	168.1	53.2	19.1	46.9
	1974	3143.7	324.7	93.1	24.1	26.1
	1975	3459.1	324.2	-0.0	23.1	-4.1
	1976	3632.1	319.8	-1.3	31.2	35.0
	1977	3914.7	356.1	11.3	93.4	199.3
Singapore	1970	2302.0	152.0	---	11.0	---
	1971	2654.9	177.5	16.7	12.0	9.0
	1972	3146.4	187.8	5.8	30.4	153.3
	1973	4780.4	279.0	48.5	51.3	68.7
	1974	7782.3	470.2	68.5	83.0	61.7
	1975	7467.0	518.4	10.2	122.6	47.7
	1976	8399.1	523.4	0.9	163.9	33.6
	1977	9552.6	727.4	38.9	256.9	56.7
Thailand	1970	1148.0	137.0	---	15.0	---
	1971	1152.4	143.4	4.6	24.1	60.6
	1972	1324.6	168.3	17.3	30.4	26.1
	1973	1334.6	227.7	35.2	45.3	49.0
	1974	2792.5	363.2	59.2	72.2	-59.9
	1975	1838.7	367.9	1.2	60.7	-15.9
	1976	3144.9	411.0	11.7	78.5	29.3
	1977	4245.1	525.4	27.8	85.2	8.5

Source: United Nations Conference on Trade and Development, Handbook of International Trade and Development Statistics, 1979 (New York: United Nations, 1979), pp. 356-360.

CHAPTER III

THEORETICAL ANALYSIS OF THE INCIDENCE OF SHIPPING COSTS OF ASEAN

Theoretical Framework of the Incidence of Transport Costs

While transport costs are formally paid by the exporter when goods are sold on cost-insurance-freight (c.i.f.) basis, and by the importer when purchases are made free-on-board (f.o.b.), the party paying the freight bill is not necessarily the one who bears the transport cost. This is due to the fact that although freight rates enter into the price of a good, it does not follow that an increase in freight rates will always raise the price by the amount of the increase in freight rates. Locklin stated that:

> This is because the increase in the price of a commodity tends to curtail consumption; production must be readjusted to the new conditions of demand, and a new equilibrium of supply and demand must be established.[45]

Analysis of the incidence of freight rates follows exactly the same laws which determine the shifting and burden of taxes on commodities.[46] The question as to who ultimately bears the incidence of freight rates can be answered as follows: it depends upon the commodity on which the charge is laid, or more specifically, upon both the elasticity of demand and that of supply. This can be easily demonstrated by the use of conventional supply-and-demand diagrams.

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[45] D. P. Locklin, Economics of Transportation, 7th ed. (Illinois: Richard D. Irwin, Inc., 1972), p. 51.

[46] T. N. Carver, "The Incidence of Costs," Economic Journal, Vol. XXXIV (December, 1924), p. 576).

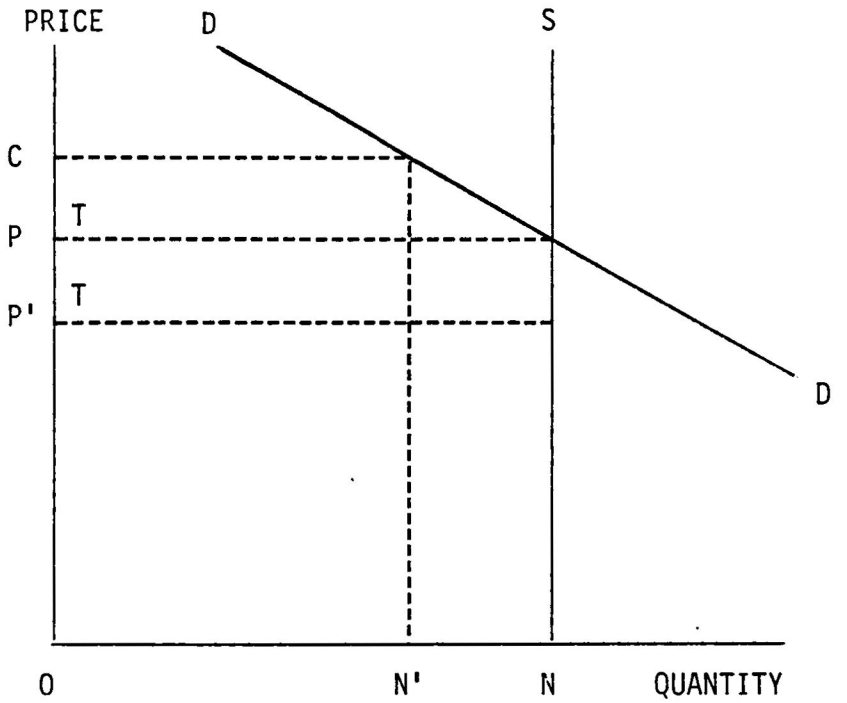
The graphical illustrations of the relations between supply and demand curves and the incidence of freight costs on prices are presented as follows.

Case I: Incidence of Freight Costs when Supply Is Perfectly Inelastic

Case I is graphically shown in Figure 1. Figure 1 depicts a situation in which the delivered supply schedule SS for an exportable commodity is completely inelastic with regard to price. In the absence of freight costs, the quantity ON would be consumed on the importing market at a price OP. Assuming that shipping costs of T per unit are introduced, it is apparent that they will not influence the market clearing price. Any attempt to add these charges to delivery price, necessitating an increase from OP to OC, would be frustrated by a deficiency of demand relative to supply. As a result, excess supply forces the market clearing price back to OP, where the f.o.b. price received by exporters is OP'. Thus, in a situation where export supply is perfectly inelastic, the exporter bears the entire burden of freight costs. The key point emerging from Figure 1 is that demand conditions fail to influence who bears freight costs if supply is inelastic.

FIGURE 1

CASE I: INCIDENCE OF FREIGHT COSTS WHEN SUPPLY IS PERFECTLY INELASTIC



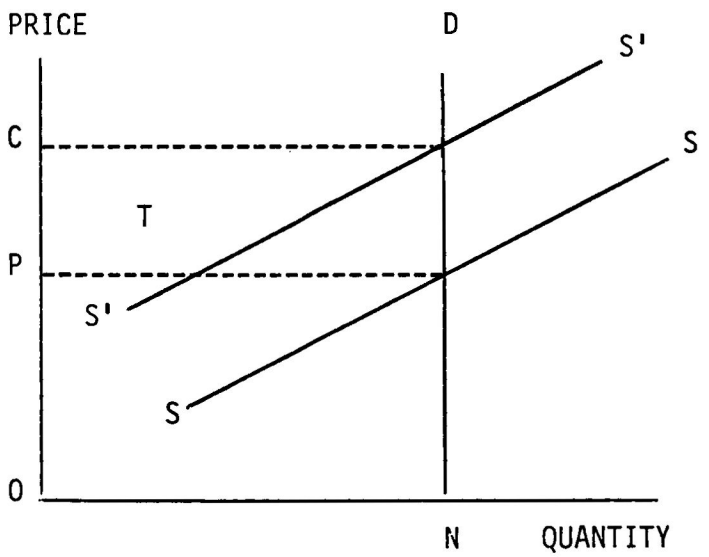
Case II: Incidence of Freight Costs when Demand Is Perfectly Inelastic

Case II is graphically shown in Figure 2. Figure 2 illustrates a situation where perfectly inelastic demand curve for an exportable good is matched with a less than perfectly inelastic supply schedule. In the absence of freight costs, quantity ON would clear the market at price OP. However, if freight costs of T per unit are introduced, the supply schedule shifts leftward by an amount equal to the transport

charge. Thus SS represents the f.o.b. supply curve, while S'S' is the delivered c.i.f. schedule. In the equilibrium situation, the market is cleared at the same quantity ON, but at a higher price OC with the increase borne by consumers. Therefore, if demand is perfectly inelastic, the supply schedule does not influence who bears freight costs. In this situation, consumers in the importing market bear the full burden of transport costs or any changes in these charges.

FIGURE 2

CASE II: INCIDENCE OF FREIGHT COSTS WHEN DEMAND IS PERFECTLY INELASTIC



Case III: Incidence of Freight Costs when Supply Is Perfectly Elastic

Case III, as illustrated in Figure 3, is generally described as that of constant cost in microeconomic theory. Either a small supply or a large one may be provided, but always at the same expense per unit.

If a transport cost on each item of commodity is imposed, the supply curve will move up correspondingly and the full incidence of transport costs will be borne by the importers. The sole difference made by the slope of the demand curve will be in the amount of reduction in supply brought about by the transport costs. The flatter the demand curve, the greater the reduction in quantity supply will be result. On the other hand, the steeper the demand curve, the lesser the reduction will be made in the quantity exported.

Case IV: Incidence of Freight Costs when Demand Is Perfectly Elastic

Case IV is illustrated in Figure 4. Figure 4 illustrated a situation in which a transport cost per unit of supply will be borne in full by exporters, regardless of the slope of the supply curve. This is because, on the assumption of an absolutely elastic demand, buyers will not take any of the product at a higher price. The supply offered will, however, be reduced as a result of the transport cost equal CP, the supply will decrease on ON' and the more elastic the supply, the greater the reduction will be made.

Case V: Incidence of Freight Costs when Supply and Demand Are Elastic

The situation described in Figures 1 through 4 may seem unrealistic. However, elasticity or inelasticity of supply and demand within a given range may be realistic.[47] Nevertheless, these limiting situations are

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[47]M. S. Kendrick, Public Finance (New York: Houghton Mifflin, 1951), p. 563.

FIGURE 3

CASE III: INCIDENCE OF FREIGHT COSTS WHEN SUPPLY IS PERFECTLY ELASTIC

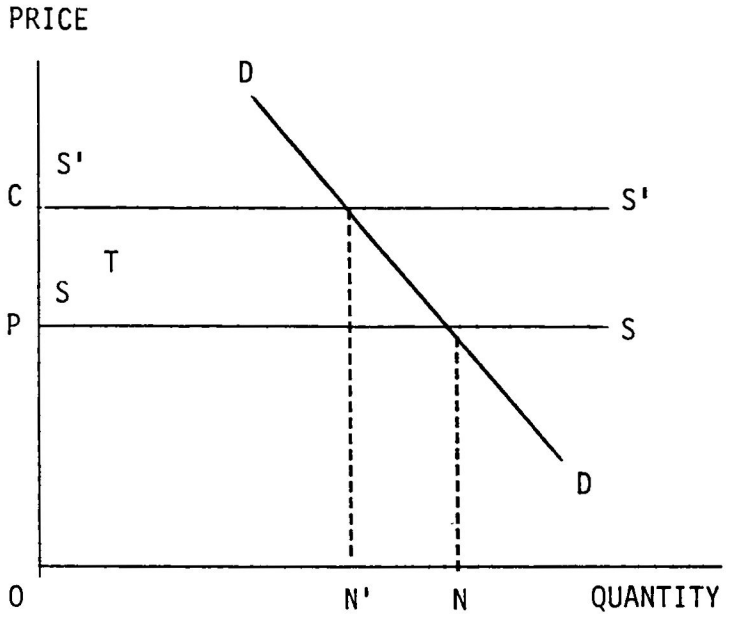
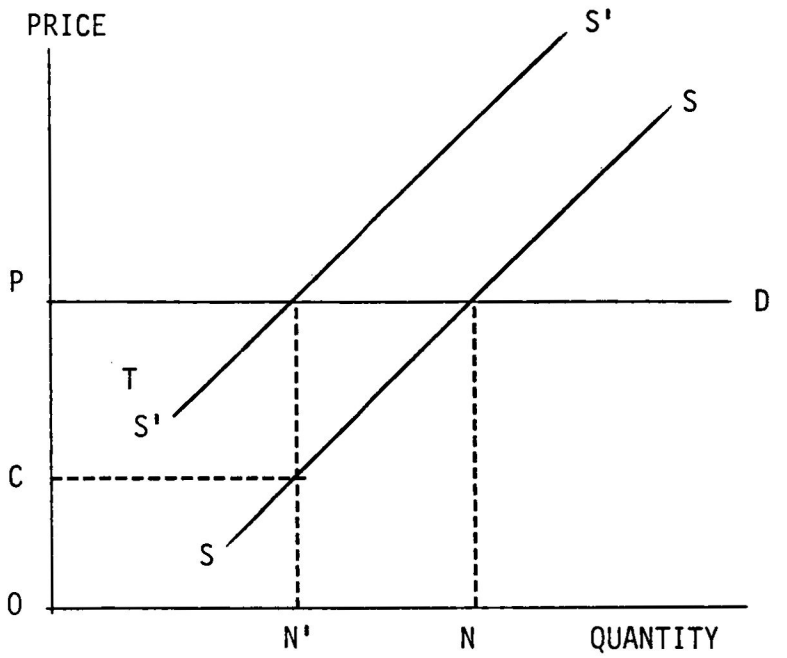


FIGURE 4

CASE IV: INCIDENCE OF FREIGHT COSTS WHEN DEMAND IS PERFECTLY ELASTIC

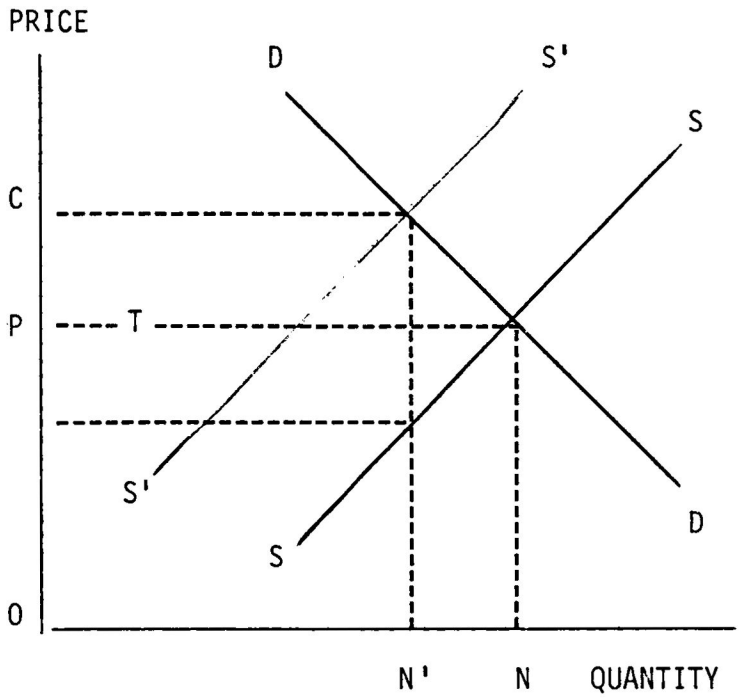


employed solely to indicate tendencies for freight costs to fall on exporters or importers. In normal situations, the actual incidence of transport costs on buyers or sellers is determined by respective elasticities of demand or supply. Figure 5 illustrates Case V which is usually described as that of increasing costs. A small supply can be produced at a low expense, but as the supply becomes larger, the costs per unit increases. The demand is shown to have some elasticity. When supply is relatively inelastic the exporter bears the major part of the freight bill, and the price he receives falls below the "zero transport costs" price by approximately the full extent of shipping costs. It also follows that the fall in quantity traded below that exchanged in the absence of transport costs is determined by supply. When supply is inelastic, the quantity reduction due to freight costs are small; however, the revenue loss to the exporter may be considerable.

With relative inelastic supply, any reduction in the elasticity of demand shifts some of the transport cost burden to the importer. When demand and supply schedules have equal elasticities, shipping burdens are shared approximately equally by buyers and sellers. As demand grows progressively less elastic, the share the freight costs borne by the buyer rises, with elasticity of demand determining the extent to which quantity exchanged falls below that trade in the absence of freight charges.

FIGURE 5

CASE V: INCIDENCE OF FREIGHT COSTS WHEN SUPPLY AND DEMAND ARE ELASTIC



Source: M. S. Kendrick, Public Finance (New York: Houghton Mifflin, 1951), pp. 560-567.

Methodology for Evaluating the Incidence of Shipping Costs

The purpose of this study, as mentioned in the first chapter, is to verify whether or not each ASEAN bears the incidence of shipping costs on her export to and import from the U. S. Under the assumption of a simple equilibrium market, clearing condition of which the price and quantities sold are jointly determined by the forces of demand and

supply, the simultaneous relations of import demand and export supply are formulated. The elasticities of the response of trade to change in prices will be estimated by applying the two-stage least squares (2LS) method to the simultaneous equation model formulated. This procedure is suitable for the purpose of the study since it is intended to correct or at least reduce the simultaneous-equation bias.[48] The model[49] is as follows:

$$QM_j^d = f_1 (Y_j, PM_j^d, P_j)$$

$$QX_i^s = f_2 (PX_i^s, P_i)$$

$$QM_j^d = QX_i^s$$

$$PM_j^d = FX_{ij} (1 + T_j) PX_i^s$$

The endogenous variables are:

QM_j^d = The quantity of imports demanded in country j,

QX_i^s = The quantity of exports supplied by country i,

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[48]Simultaneous-equation bias is the bias arising from the application of the classical least squares to any equation belonging to a system of simultaneous relations. It originates from the violation of assumption of the classical least squares, that is, it arises from the dependence of the explanatory variables and the disturbance term. In addition, the application of the OLS method also yields inconsistent estimates. For a proof see J. Johnston, Econometric Method, 2nd edition (New York: McGraw-Hill, 1971, C 1972), p. 344.

[49]S. P. Magee, "Price, Income and Foreign Trade: A Survey of Recent Economic Studies," International Trade and Finance: Frontiers for Research, ed. P. B. Kenen (Cambridge: Cambridge University Press, 1975), p. 183.

PM_j^d = The price of imports facing demanders in country j in j's currency, and

PX_i^s = The export price received by suppliers in exporting country i in i's currency.

The exogenous variable are:

Y_j = Income in country j,

P_j = The price of goods produced in country j,

P_i = The price of goods sold in country i,

FX_{ij} = The foreign-exchange rate linking currency i to j, and

T_j = The proportional tariff rate in country j.

Conceptually, the variable T_j should represent tariffs, transport costs, insurance and all other differences between the price received by the supplier and the price paid by the demander in the importing country.[50]

For estimating the equations, the log-linear form is used because of its simplicity in evaluating elasticities. In addition, a dummy variable is added in the traditional model to account for the drastic increase of oil prices during the years of 1973 to 1975. The parameter of this variable should be marked with a negative sign. Therefore,

$$\ln QM_j^d = a_1 + a_2 \ln Y_j + a_3 \ln PM_j^d + a_4 \ln P_j + a_5 DMV + U_j$$

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[50] S. P. Magee, "Price, Income and Foreign Trade: A Survey of Recent Economic Studies," International Trade and Finance: Frontiers for Research, ed. P. B. Kenen (Cambridge: Cambridge University Press, 1975), p. 184.

$$\ln QX_i^s = b_1 + b_2 \ln PX_i^s + b_3 \ln P_i + Ui$$

$$QM_j^d = QX_i^s$$

$$PM_j^d = FX_{ij} (1 + T_j) PX_i^s$$

Where DMV = a dummy variable specified as 1 for the years of 1973, 1974 and 1975; 0 for the other years. The model will be formulated in two ways, namely the U. S. as an importer with each ASEAN country as an exporter and vice versa.

Commodity Coverage

All commodities covered will be classified according to the Standard International Trade Classification (SITC).[51] In order to dispel or at least reduce the effect of the aggregation-over-commodity problems,[52] this study focuses on the more thorough SITC level as much as possible. The four-digit SITC and, in some commodity groups, the five-digit SITC level are used. Nevertheless, there still exists some degree of aggregation problem due to the fact that each level of SITC group is formed by the aggregation of smaller SITC-digit level.[53]

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[51]The SITC used in this study is based on the United Nations Statistical Office, Department of Economics and Social Affairs, Standard International Trade Classification (Revised ed.; Statistical Papers, Series M, No. 34, 1961).

[52]R. G. D. Allen, Mathematical Economics, 2nd edition (London: The Macmillan Press Ltd., 1959), pp. 694-724.

[53]R. G. D. Allen and J. Edward Ely, International Trade Statistics (New York: John Wiley and Sons, Inc., 1953), p. 190.

As this study purports to draw implications from the U. S.-ASEAN transaction for examining the elasticities of the response of trade to change in prices, those commodities selected must be proved significant for both exporter and importer in terms of quantity transacted. This means that this study will not take into account a commodity which has a substantially high share in the exports of a certain country but has only small percentages in the same transaction to the trading-partner country. Even though Malaysia, Thailand, Indonesia and Singapore have ores and concentrates of tin (SITC 283.6) as their large percentage share in the commodity compositions for export, the U. S. has not relied on ASEAN as far as this export category is concerned. The U. S. has imported a sizable amount of tin ores and concentrates from Bolivia.[54] Hence the category of this kind is not included.

Description and Sources of Data

This study is based on the annual data from 1967 to 1979. Each variable employed in the simultaneous-equation model, the description of how to obtain each variable in practice and its sources of data are respectively presented according to the order of its appearance as follows:

QM_j^d = The import quantity of the commodity concentrated of jth country, in metric tons, number, etc., the data are obtained basically from UN: The World Trade Annual, various issues.

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[54]United Nations. World Trade Annual, various issues. See also UN: Commodity Trade Statistic, various issues.

PM_j^d = A relative import unit value in jth currency. It is derived from the following formula:

$$PM_j^d = PX_i^s \ (1 + T_j) \ FX_{ij}$$

Where FX_{ij}, market exchange rate linking currency i to jth is obtained from IMF: International Financial Statistics, Year Book 1980, annual data 1949-1980 (English), Vol. XXXII. Both indices have 1975 as a base year.

Y_j = The real income of jth country, in jth's currency. Concerning the Philippines, it is obtained from deflating the gross domestic product (GDP) by the GDP deflator, in millions of pesos. In the case of Singapore, it is obtained from deflating the GDP by the GDP deflator, in millions of Singapore dollars. For Idonesia, it is obtained from deflating the GDP by the GDP deflator, in billions of Rupiahs. As far as Malaysia is concerned, it is obtained from the GDP at 1975 prices, in millions of Ringgits. For Thailand it is obtained from deflating the GDP by the GDP deflator, in billions of Baht. For the U. S., it is obtained by deflating the GDP by the GDP deflator.

The GDP deflator is obtained from UN: Yearbook of National Accounts Statistics 1978, Vol. II International Tables.[55]

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[55]All the deflated GDP values of the ASEAN countries has been changed to a dollar basis by using a foreign exchange rate of each country.

P_j = General price index (GPI) of jth country. GPI is used as a proxy of the price of goods produced in country jth. For Indonesia, Malaysia and Singapore, the consumer price index is used. For the U. S., the Philippines and Thailand, the wholesale price index is used. All use 1975 = 100 as a base year. The data are obtained from the same source as DM_j and DX_i.

DMV = Dummy variable, specified as 1 for 1973, 1974 and 1975; 0 for the other years.

QX_i^s = The export quantity of the commodity concentrated of ith country, in metric tons, number, etc. The data are obtained from the same source as QM_j^d.

PX_i^s A relative export unit value of country ith, in ith currency. Unit value is used instead of the actual price since it is not possible to obtain the time series of actual price. This variable is obtained by deflating the F. A. S.[56] export unit value by export unit value index. Concerning each commodity exported, its unit value is derived from dividing its export earnings by the quantity exports. The

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[55]All the deflated GDP values of the ASEAN countries has been changed to a dollar basis by using a foreign exchange rate of each country.

[56]The f.a.s. valuation represents the transportation value at the port of exportation and is based on the purchase plus all changes incurred in placing merchandise alongside the vessel at the port of f.a.s. exportation. The f.o.b. valuation differs from f.a.s. only in that cost of locating the merchandise on the vessel is included.

annual data of export earnings and quantities are collected from the same sources as QM_j^d and QX_i^s.

T_j = The tariff rate imposed on the importation of the commodity considered by jth country.

CHAPTER IV

EMPIRICAL RESULTS AND ECONOMIC INTERPRETATION

Identification of the Incidence of Shipping Costs of ASEAN

Identification of ASEAN's incidence of shipping costs of the selected commodities will be presented empirically on the country-by-country basis. Since this study is only concerned with price elasticity, the following consideration will concentrate on this particular parameter. As suggested by the demand theory, for normal goods, decrease of price will generate a higher demand. Thus, the demand price elasticity should be marked with a negative sign. As regards to supply price elasticity, it should have a positive sign. However, from the statistical results, it can be found that the demand price elasticity may have a positive sign and supply price elasticity may have a negative sign. In the case of negative supply elasticity, it can be interpreted as an external economics forward-falling supply curve.[57] If this is the case, the incidence of transport costs is indeterminate because the solution desired depends on the quantities which are not known, namely, the magnitude of costs of the separated

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[57]The forward-falling supply curve is not the only supply curve that may be negatively sloped. The backward-rising supply curve is another kind of supply curve which has negative slope. Even the forward-falling fashion may originate from different sources. However, under competitive condition, an external-economies-forward-falling supply curve is theoretically more relevant than a forward-falling supply curve generating from internal decreasing cost firms. This is because the latter will lead to destruction of competitive market. More details are to be found in P. A. Samuelson, Economics, 10th ed. (New York: McGraw-Hill, 1976), p. 479.

firms are reduced by external economies as industrial output expands, and the magnitude of costs are raised by transport costs. If the former is greater than the later, ceteris paribus, it implies that the delivery price in the importing market is unaffected by freight costs and thus the shipping burden will be borne in full by the exporters. Conversely, if the latter is greater than the former, any attempt at identification is still ambiguous since it further depends on the extent to which the delivery price is raised due to the imposition of transport costs.

However, the negative supply elasticity and positive demand elasticity may be attributed to deficiencies of the empirical data employed for the estimation of the model and the incompatible functional form used rather than the above case of supply elasticity and the odd Giffen case of demand elasticity. Such an unsatisfactory case may arise from the assumption of similar functional form (log-linear form) on different applications. This assumption inevitably limits the study from using another form which might be the actual one. In other words, priority should always be given to the fulfillment of the economic a prior criteria (sign and size of the estimates). In general, the estimates of the parameters should be rejected or considered unsatisfactory if they happen to have the "wrong" sign (or size) even though the correlation coefficient is high, or the t-values suggest that the estimates are statistically significant. In such cases, though the parameters are statistically significant, they are theoretically implausible and make no sense on the basis

of the a priori theoretical-economic criteria.[58] Thus, in the case where unsatisfactory estimates exist, it will be considered as indeterminate or unidentifiable case and will not be taken into account.

Statistical results are summarized in tabular form from Table 2 to Table 11. In each of the tables, the values of the estimated coefficients are shown together with the corresponding "t-value" in parenthesis below. The coefficient of determination R^2 is calculated for the individual equation although its meaning in simultaneous models is at best ambiguous. This is because it is not bounded (0, 1) but by $(-\infty, 1)$ so that R^2 - values are not an indication of poor fit.[59] But R^2 - values which are close to unity are still a fairly good indicator of the goodness-of-fit of the individual equation.[60] However, the purpose of this study is the analysis of economic phenomena and the estimation of reliable values of particular economic parameters rather than for forecasting purpose. Consequently, the t-statistics is a more important criterion than the coefficient of determination.[61]

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[58]A. Koutsoyiannis, Theory of Econometrics, 2nd edition (London: The Macmillan Press Ltd., 1977), p. 26.

[59]M. Goldstein and M. S. Khan, "The Supply and Demand for Exports: A Simultaneous Approach," The Review of Economic and Statistics, No. 2 (May, 1978), p. 278.

[60]Ibid., p. 281.

[61]Koutsoyiannis, op. cit., p. 67.

ASEAN as an Importer with the U. S. as an Exporter

The Philippines

The U. S. supply price elasticities of exports to the Philippines and the Philippines' demand price elasticities of imports from the U. S. of the selected commodities are presented in Table 2. There are three satisfactory cases which attain the economic a priori criteria (i. e. those having correct signs of estimates).

The statistical result of iron and steel scrap (SITC 282.0) indicates that the Philippines' import demand price elasticity is significantly different from zero at less than ten percent level of significance, while the U. S. export supply price elasticity is not significant. Therefore, almost all of the incidence originating from shipping costs of this commodity is borne by the U. S. exporters. This can be illustrated as in Case I.

As a result of the low t-values of the remaining two commodities [milk and cream (SITC 022.2) and unmanufactured tobacco (SITC 121.0)], the supply and demand price elasticities are not statistically significant. It implies that supply and demand have negligible responses for any price changes and thus the shipping burden is indeterminate.

In conclusion, the U. S. exporters of the selected commodities bear the major part of the incidence of shipping in the case of iron and steel scrap (SITC 282.0).

Singapore

The U. S. supply price elasticities of exports to Singapore and Singapore's demand price elasticities of imports from the U. S. of the

TABLE 2

ESTIMATED PRICE ELASTICITIES OF THE PHILIPPINES' IMPORTS AND THE U. S. EXPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is the Philippines' Demand Price Elasticity of Imports from the U. S.
Es Is the Supply Elasticity of Exports to the Philippines

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
022.2	Milk and Cream	Qx	18.2	1.94	-2.09	0.31	1.79[a]	Qm	21.4	-6.19	-1.24	2.38	-2.79	0.41	1.85
			(3.92)	(1.39)	(-2.09)				(0.09)	(-0.07)	(-0.04)	(0.04)	(-0.09)		
121.0	Tobacco, Unmanufactured	Qx	8.60	1.50	-0.0011	0.16	1.71[a]	Qm	9.69	-1.71	0.25	0.81	-0.39	0.18	1.77
			(5.09)	(1.37)	(-0.00)				(2.00)	(-1.20)	(0.25)	(1.07)	(-0.93)		
282.0	Iron and Steel Scrap	Qx	9.75	.61	0.34	0.29	2.39[a]	Qm	43.0	-4.17	-2.96	-0.29	-1.34	0.58	2.85
			(1.20)	(1.20)	(0.27)				(2.64)	*(-2.52)	(-1.78)	(-0.39)	(-1.95)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
* The estimate is significantly different from zero at 10% level or less.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

selected commodities are presented in Table 3. There are three satisfactory cases which fulfill the economic a priori criteria (sign of the estimates).

The statistical results of unmilled wheat and meslin (SITC 041.0) and raw cotton (SITC 263.1) indicate that the Singapore's demand price elasticities of these two commodities are not statistically significant, while their corresponding U. S. supply price elasticity are significantly different from zero at ten percent or less. Therefore, almost all the incidence originating from shipping costs is borne by Singapore's importers, and this can be illustrated as in Case II.

As a result of the low t-values of the remaining commodity [tractors other than road tractors (SITC 712.5)], the supply and demand price elasticities are not statistically significant. It implies that supply and demand have negligible responses for any price changes and thus the shipping burden is indeterminate.

In conclusion, Singapore's importers of the selected commodities bear the major part of the incidence of shipping in the case of unmilled wheat (SITC 041.0) and raw cotton (SITC 263.1).

Malaysia

The U. S. supply price elasticities of exports to Malaysia and Malaysia's demand price elasticities of imports from the U. S. of the selected commodities are reported in Table 4. Concerning Malaysia, three statistical results are satisfactory; however, as a result of low t-values of these three commodities, the supply and demand price

TABLE 3

ESTIMATED PRICE ELASTICITIES OF SINGAPORE'S IMPORTS AND THE U. S. EXPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed is Singapore's Demand Price Elasticity of Imports from the U. S.
Es Is the U. S. Supply Price Elasticity of Exports to Singapore

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
041.0	Wheat and Meslin, Unmilled	Qx	8.61	0.85	0.81	67.9	2.02[a]	Qm	-11.5	-1.49	-1.99	8.25	0.51	75.0	2.49
			(1.81)	*(2.15)	(1.15)				(-0.53)	(-0.40)	(-0.81)	(0.98)	(0.41)		
263.1	Raw Cotton other than Linters	Qx	24.2	3.47	-3.52	71.1	2.77[a]	Qm	20.1	6.48	-0.29	-3.56	1.24	82.4	3.25
			(2.92)	*(2.89)	(-1.83)				(1.42)	(1.71)	(-0.44)	(-0.74)	(2.18)		
712.5	Tractors other than Road Tractors	Qx	2.03	0.68	1.25	44.8	1.48[a]	Qm	14.5	1.09	1.42	-5.78	0.44	64.9	1.63
			(0.36)	(1.22)	(1.14)				(2.95)	(0.71)	(0.24)	(-0.83)	(0.47)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
* The estimate is significantly different from zero at 10% level or less.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

TABLE 4

ESTIMATED PRICE ELASTICITIES OF MALAYSIA'S IMPORTS AND THE U. S. EXPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is Malaysia's Demand Price Elasticities of Imports from the U. S.
Es Is the U. S. Supply Price Elasticities of Exports to Malaysia

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
121.0	Tobacco, Unmanufactured	Qx	11.1	0.76	-0.82	8.5	1.86[a]	Qm	3.73	-0.35	-0.29	1.83	-0.20	15.0	1.99
			(1.83)	(0.60)	(-0.49)					(-0.28)	(-0.66)	(0.72)	(-0.48)		
674.1	Iron/Steel Plants and Sheets	Qx	26.5	1.12	-4.30	40.2	2.51[a]	Qm	23.7	-1.13	2.15	-8.31	-0.39	46.9	2.43
			(1.39)	(0.55)	(-1.18)				(1.16)	(-0.42)	(0.99)	(-1.43)	(-0.30)		
712.5	Tractors, Other than Road Tractors	Qx	3.97	-0.38	0.592	12.1	1.23[a]	Qm	5.72	-1.68	-2.24	6.0	0.79	14.5	1.29
			(0.67)	(-0.55)	(0.59)				(0.28)	(-0.43)	(-0.44)	(-0.55)	(0.28)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

elasticities are not statistically significant. It implies that supply and demand have negligible responses for any price changes and thus the shipping burden is indeterminate.

As regards to Malaysia, it is evident that no conclusion can be drawn.

Thailand

The U. S. supply price elasticities of exports to Thailand and Thailand's demand price elasticities of imports from the U. S. of the selected commodities are reported in Table 5. As for Thailand, three selected cases are considered satisfactory, obtaining correct signs; however, as a result of low t-values of these three commodities, the supply and demand price elasticities are not statistically significant. It implies that supply and demand have negligible responses for any price changes and thus the shipping burden is indeterminate.

As regards to Thailand, it is evident that no conclusion can be drawn.

Indonesia

The U. S. supply price elasticities of exports to Indonesia and Indonesian demand price elasticities of imports from the U. S. of the selected commodities are reported in Table 6.

The statistical results of rice (SITC 042.2) indicate that the Indonesian demand price elasticity of this commodity is not statistically significant, while its corresponding U. S. supply price elasticity is significantly different from zero at less than ten percent. Thus, the

TABLE 5

ESTIMATED PRICE ELASTICITIES OF THAILAND'S IMPORTS AND THE U. S. EXPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is Thailand's Demand Price Elasticity of Imports from the U. S.
Es Is the U.S. Supply Price Elasticity of Exports to Thailand

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
561.1	Nitrogenous Fertilizers and Materials	Qx	-4.55	1.88	2.54	22.4	1.69[a]	Qm	-31.1	-2.77	-4.72	11.96	-0.45	44.0	2.58
			(-0.64)	(1.09)	(1.69)				(-0.88)	(-1.20)	(-0.78)	(1.02)	(-0.39)		
674.1	Iron/Steel Plates and Sheets	Qx	-2.47	0.56	2.69	63.1	3.31[b]	Qm	239	-97.7	16.48	-34.95	15.0	73.4	3.11
			(-0.88)	(1.53)	(4.10)				(0.88)	(-0.85)	(0.92)	(-0.85)	(0.91)		
712.2	Agricultural Machinery and Appliances	Qx	-6.33	11.7	1.97	69.6	1.84[a]	Qm	-5.90	1.57	0.60	1.46	-0.61	74.5	2.08
			(-0.90)	(0.33)	(3.81)				(-0.65)	(0.69)	(0.40)	(0.60)	(-1.22)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
[b] The Durbin-Watson tests indicate inconclusive at 5% level.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

TABLE 6

ESTIMATED PRICE ELASTICITIES OF INDONESIAN IMPORTS AND THE U. S. EXPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is Indonesian Demand Price Elasticity of Imports from the U. S.
Es Is the U. S. Supply Price Elasticity of Exports to Indonesia

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
042.2	Rice, Glazed or Polished, but not otherwise Worked	Qx	4.25	3.93	0.46	34.1	2.12[a]	Qm	18.5	5.05	-0.55	-5.96	-7.58	47.6	2.27
			(0.89)	*(2.21)	(0.66)				(0.44)	(0.11)	(-0.04)	(-0.13)	(-0.20)		
121.0	Tobacco, Unmanufactured	Qx	4.91	-.34	0.18	28.1	1.86[a]	Qm	-4.37	5.09	-1.31	-4.60	-0.11	52.2	2.13
			(9.20)	(-0.55)	(1.14)				(-0.42)	(1.30)	(-0.51)	(-2.04)	(-0.23)		
712.5	Tractors, other than Road Tractors	Qx	7.52	1.24	0.17	8.0	0.89[a]	Qm	-3.97	.28	-2.26	3.15	-0.22	46.1	1.69
			(2.12)	(0.87)	(0.49)				(-0.48)	(0.33)	(-0.83)	(1.22)	-0.26		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
* The estimate is significantly different from zero at 10% level or less.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

incidence of shipping costs of this commodity is borne by Indonesian importers. This can be illustrated as in Case II.

As a result of low t-values of the remaining two commodities [tobacco, unmanufactured (SITC 121.0) and tractors other than road tractors (SITC 712.5)], the supply and demand price elasticities are not statistically significant. It implies that supply and demand have negligible responses for any price changes and thus the shipping burden is indeterminate.

In conclusion, Indonesian importers of the selected commodities bear the major part of the incidence of shipping in the case of rice (SITC 042.2) only.

Summary of the First Part of the Regression Analysis: ASEAN as an Importer with the U. S. as an Exporter

If ten percent level of significance is used as a criterion of hypothesis testing, no conclusion concerning shipping incidence for at least eleven commodities from the fifteen can be drawn because both the supply and the demand of these commodities may be regarded irresponsive to price changes. However, the remaining four commodities are statistically significant at ten percent or less. For example, the Philippines' import demand price elasticity of the iron and steel scrap (SITC 282.0) is significantly different from zero at less than ten percent level of significance, while the U. S. export supply price elasticity is not significant. Therefore, almost all of the incidence originating from shipping costs of this commodity is borne by the U. S. exporters. This can be illustrated as in Case I.

For Singapore, the statistical results of unmilled wheat and meslin (SITC 041.0) and raw cotton (SITC 263.1) indicate that Singapore's demand price elasticities of these two commodities are not statistically significant, while their corresponding U. S. supply price elasticity are significantly different from zero at ten percent or less. Therefore, almost all the incidence originating from shipping costs is borne by Singapore's importers, and this can be illustrated as in Case II.

For Indonesia, the statistical results of rice (SITC 042.2) indicate that the Indonesian demand price elasticity of this commodity is not significant, while its corresponding U. S. supply price elasticity is significantly different from zero at less than ten percent. Thus, the incidence of shipping costs of this commodity is borne by Indonesian importers. This can be illustrated as in Case II.

ASEAN as an Exporter with the U. S. as an Importer

The Philippines

The U. S. demand price elasticities of imports from the Philippines and the Philippines' price elasticities of exports to the U. S. of the selected commodities are presented in Table 7. There exist three satisfactory cases (i.e. those having correct signs of both demand and supply elasticities).

The statistical result shown in Table 7 indicates that none of these three commodities is significant, and that is a result of low t-values. This implies that supply as well as demand have negligible responses for any price changes and thus the shipping burden is indetermine.

TABLE 7

ESTIMATED PRICE ELASTICITIES OF THE PHILIPPINES' EXPORTS AND THE U. S. IMPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is the U. S. Demand Price Elasticity of Imports from the Philippines
Es Is the Philippines' Supply Price Elasticity of Exports to the U. S.

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
061.1	Raw Sugar, but Can (not Including Syrup)	Qx	10.7	0.20	0.31	22.9	2.48[a]	Qm	-5.52	-1.83	2.87	-0.43	0.55	36.7	2.77
			(8.11)	(0.59)	(1.48)				(-0.16)	(-0.43)	(0.64)	(-0.46)	(0.40)		
242.3	Sawlogs and Veneer Logs	Qx	10.2	0.55	-0.94	66.2	1.69[a]	Qm	-26.7	-3.14	6.53	-3.68	-0.21	69.3	1.94
			(1.57)	(0.65)	(-1.04)				(-0.34)	(-0.67)	(0.51)	(-0.82)	(-0.19)		
283.11	Ores and Concentrates of Copper	Qx	10.1	0.20	0.006	7.3	2.23[a]	Qm	10.2	-0.09	0.26	-0.64	-0.06	19.0	2.14
			(17.64)	(0.75)	(0.04)				(3.73)	(-0.14)	(0.48)	(-0.87)	(-0.36)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

As regards to the Philippines, it is evident that no conclusion can be drawn.

Singapore

The U. S. demand price elasticities of imports from Singapore and Singapore's supply supply price elasticities of exports to the U. S. of the selected commodities are presented in Table 8. There exist three satisfactory cases (i.e. those having correct signs of both demand and supply elasticities).

The statistical result of fruit, temporarily preserved (SITC 053.6) indicates that the export supply elasticity is significantly different from zero at five percent level; whereas the corresponding import demand elasticity can be regarded as statistically insignificant due to the low t-value, and thus implying that almost all of the shipping incidence is borne by the American importers. This can be illustrated as in Case II.

As for papper and pimiento (SITC 075.1) and natural rubber (SITC 231.1), as a result of low t-values, the supply and demand price elasticities are not statistically significant. It implies that supply as well as demand have negligible responses for any price changes, therefore, the shipping burden is indeterminate.

Malaysia

The U. S. demand price elasticities of imports from Malaysia and Malaysia's supply price elasticities of exports to the U. S. of the selected commodities are presented in Table 9.

TABLE 8

ESTIMATED PRICE ELASTICITIES OF SINGAPORE'S EXPORTS AND THE U. S. IMPORTS:
A SIMULTANEOUS APPROACH, 1967-1979

Ed Is the U. S. Demand Price Elasticity of Imports from Singapore
Es Is Singapore's Supply Price Elasticity of Exports to the U. S.

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
053.6	Fruit, Temporarily Preserved	Qx	46.0	4.62	-7.47	51.4	1.85[a]	Qm	87.9	-29.4	-58.4	77.7	-2.91	61.6	2.22
			(3.27)	*(2.32)	(-2.70)				(0.38)	(-0.27)	(-0.30)	(0.29)	(-0.31)		
075.1	Papper and Pimiento	Qx	6.02	0.76	0.19	36.9	1.52[a]	Qm	-1.49	-4.35	1.53	0.81	-0.43	42.8	1.35
			(0.68)	(0.70)	(0.09)				(-0.07)	(-0.71)	(0.33)	(0.25)	(-0.95)		
231.1	Natural Rubber and Similar Natural Gums	Qx	20.8	0.18	-2.24	41.8	1.23[a]	Qm	28.1	-3.44	-8.73	10.77	-0.72	57.5	1.78
			(1.17)	(0.08)	(-0.59)				(3.78)	(-0.23)	(-0.47)	(0.34)	(-0.47)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
* The estimate is significantly different from zero at 10% level or less.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

TABLE 9

ESTIMATED PRICE ELASTICITIES OF MALAYSIA'S EXPORTS AND THE U. S. IMPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is the U. S. Demand Price Elasticity of Imports from Malaysia
Es Is Malaysia's Supply Price Elasticity of Exports to the U. S.

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
075.1	Papper and Pimiento	Qx	-43.8	4.77	11.70	20.6	1.52[a]	Qm	-18.9	13.9	-1.95	13.77	-1.20	36.5	1.70
			(-0.96)	(1.00)	(1.12)				(-0.68)	(1.07)	(-0.45)	(1.39)	(-1.63)		
231.1	Natural Rubber and Similar Natural Gums	Qx	14.3	0.08	-0.43	14.9	1.46[a]	Qm	10.1	1.05	2.47	-3.64	0.16	40.3	1.93
			(1.51)	(0.08)	(-0.22)				(5.87)	(0.85)	(1.58)	(-1.47)	(0.76)		
652.2	Cotton Fabrics	Qx	-66.0	3.12	16.32	14.4	.61[a]	Qm	-59.6	4.26	14.50	-7.73	-1.13	34.9	1.11
			(-0.94)	(0.99)	(1.05)				(-0.94)	(0.90)	(1.17)	(-1.20)	(-0.49)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

As a result of low t-values of all the three selected commodities, the supply and demand price elasticities are not statistically significant. It implies that supply as well as demand have negligible respones for any price changes, therefore, the shipping burden is indeterminate.

Thailand

The U. S. demand price elasticities of imports from Thailand and Thailand's supply price elasticities of exports to the U. S. of the selected commodities are presented in Table 10.

The statistical results of tin (SITC 687.1) indicate that the supply price elasticity of this commodity is significantly different from zero at ten percent or less, while its corresponding demand price elasticity is not statistically significant. This implies that almost all of the shipping incidence is borne by the U. S. importers. This can be illustrated as in Case II.

As a result of the low t-value, the supply and demand of natural rubber (SITC 231.1) and tobacco, unmanufactured (SITC 121.0) might be regarded as having negligible responses for any changes and thus shipping incidence of these two commodities are unspecified.

In conclusion, the U. S. importers bear the major part of shipping costs in the case of tin and tin alloys unwrought (SITC 687.1).

Indonesia

The U. S. demand price elasticities of imports from Indonesia and Indonesian supply price elasticities of exports to the U. S. of the selected commodities are presented in Table 11. There are three

TABLE 10

ESTIMATED PRICE ELASTICITIES OF THAILAND'S EXPORTS AND THE U. S. IMPORTS: A SIMULTANEOUS APPROACH, 1967-1979

Ed Is the U. S. Demand Price Elasticity of Imports from Thailand
Es Is Thailand's Supply Price Elasticity of Exports to the U. S.

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
121.0	Tobacco, Unmanufactured	Qx	-34.9	3.26	9.55	78.2	1.94[a]	Qm	-23.2	-0.66	5.15	-1.04	0.07	82.3	2.09
			(-2.23)	(1.72)	(2.67)				(-2.77)	(-0.47)	(1.22)	(-0.17)	(0.15)		
231.1	Natural Rubber and Similar Nartual Gums	Qx	16.7	1.59	-1.23	27.1	1.48[a]	Qm	-1.82	-0.81	2.82	-1.36	-0.49	64.0	2.09
			(1.21)	(0.71)	(-0.43)				(-0.39)	(-0.48)	(1.14)	(-0.33)	(-1.54)		
687.1	Tin and Tin Alloys, Unwrought	Qx	20.1	1.34	-3.01	78.2	2.02[a]	Qm	15.0	0.36	-0.81	-0.36		78.6	2.19
			(6.72)	*(2.44)	(-3.37)				(5.77)	(2.64)	(-0.69)	(-0.27)			

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
* The estimate is significantly different from zero at 10% level or less.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

TABLE 11

ESTIMATED PRICE ELASTICITIES OF INDONESIAN EXPORTS AND THE U. S. IMPORTS:
A SIMULTANEOUS APPROACH, 1967-1979

Ed Is the U. S. Demand Price Elasticity of Imports from Indonesia
Es Is Indonesian Supply Price Elasticity of Exports to the U. S.

SITC	Commodities	Dependent Variable	Constant	Es (Px_i)	P_i	R^2	D. W.	Dependent Variable	Constant	Ed (PMd_j)	Y_j	P_j	D.M.V.	R^2	D. W.
121.0	Tobacco, Unmanufactured	Qx	3.64	0.23	0.89	45.4	1.47[a]	Qm	-12.6	-0.75	3.67	-2.58	1.17	76.5	2.02
			(2.72)	(0.45)	(2.75)				(-1.86)	(-0.46)	(1.04)	(-0.70)	(1.50)		
231.1	Natural Rubber and Similar Natural Gums	Qx	12.5	0.60	0.09	87.9	.94[a]	Qm	9.83	-0.21	-1.07	2.06	0.11	89.5	1.29
			(26.12)	*(4.87)	(0.96)				(1.70)	(-0.26)	(-0.59)	(1.94)	(0.91)		
687.1	Tin and Tin Alloys, Unwrought	Qx	1.06	0.67	1.31	81.9	1.25[a]	Qm	-68.8	-7.77	24.69	-9.18	0.07	90.3	2.45
			(0.92)	(1.20)	(3.04)				(-3.04)	*(-2.07)	(2.83)	(-2.49)	(0.14)		

[a] The Durbin-Watson tests indicate no auto correlation at the 5% level.
* The estimate is significantly different from zero at 10% level or less.
Note: The figures in the parentheses are the t-statistics.

Source: Computed from the data in UN: World Trade Annual, various issues.

satisfactory cases (i.e. having correct signs of both demand and supply elasticities).

The statistical results of tin and tin alloys unwrought (SITC 687.1) indicate that the demand price elasticity is significantly different from zero at ten percent level, while its corresponding supply elasticity is not significant. Therefore, the major part of the burden stemming from shipping costs is borne by Indonesian exporters.

As for natural rubber and similar natural gums (SITC 231.1) the statistical results indicate that Indonesian supply price elasticity is significantly different from zero at ten percent or less, while its corresponding, the U. S., demand price elasticity is not statistically significant. Therefore, almost all of the incidence originating from shipping costs of this commodity is borne by the U. S. importers. This can be illustrated as in Case II.

As a result of the low t-values, the supply and demand of tobacco, unmanufactured (SITC 121.0) might be regarded as having negligible responses for any price changes and thus the shipping burden is unspecified.

Summary of the Second Part of the Regression Analysis: ASEAN as an Exporter with the U. S. as an Importer

If we use a ten percent level of significance as a criterion of hypothesis testing, no conclusion concerning shipping incidence for most of the commodities which have been used can be drawn because, both the supply and the demand of these commodities may be regarded as irresponsive to price changes. However, there are four commodities which are statistically significant at ten percent or less. For example,

the statistical results of fruit, temporarily preserved (SITC 053.6) indicate that the export supply price elasticity of Singapore is significantly different from zero at less than ten percent level, whereas the corresponding import demand price elasticity is not significant. This implies that almost all of the shipping incidence is borne by the American importers. This can be illustrated as in Case II.

For Thailand, the statistical results of tin (SITC 687.1) indicate that the supply price elasticity of this commodity is significantly different from zero at ten percent or less, while its corresponding demand price elasticity is not statistically significant. This implies that almost all of the shipping incidence is borne by the U. S. importers.

For Indonesia, the statistical results of tin (SITC 687.1) indicate that the demand price elasticity is significantly different from zero at ten percent level, while its corresponding supply price elasticity is not significant. Therefore, the incidence of shipping costs is borne by Indonesian exporters. Also, the statistical results of the natural rubber (SITC 231.1) indicate that Indonesian supply price elasticity is significantly different from zero at less than ten percent level, while its corresponding, the U. S., demand price elasticity is not significant. Thus, almost all of the incidence originating from shipping costs of this commodity is borne by the U. S. importers. This can be illustrated as in Case II.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

The geographical location of ASEAN makes the countries highly contingent on ocean transportation and particularly international sea transport. The vital problem of ASEAN countries, like that of other developing countries, is the dependence on third countries service. The immediate effect of this reliance is a deficit on the balance of payments, freight and insurance account. Moreover, since the so-called Liner Conference dominate most of the nonpetroleum-product trades, the other problems faced by ASEAN concern the structure, operation and practices of the Liner Conference. The next problem is that ASEAN shippers inevitably bear the major part of incidence of shipping costs due to the peculiarity of each commodity in international trade.

Shipping is one of the few industries which are subjected to a set of international rules as well as various conventions and established practices. Shipping is, in fact, an industry that produces the sea transport services and sells them to other industries for the freight or charter hire. Consequently, shipping market can be divided into the freight market and the ship chartering market. In the freight market buyers are cargo owners, sellers are ship operators and commodities transacted are the sea transport services. In the ship chartering market buyers are ship operators, sellers are shipowners and commodities transacted are the carriers.

From the analysis of the balance of payment, freight and insurance account, it is evident that the balance of payment of ASEAN is strained by large freight payment. This is because ASEAN considerably depends on other country's services. However, the position of Singapore is significantly different from that of the other four ASEAN countries. The deficit in the balance of payment, freight and insurance account of Singapore tends to decline while that of the other members varies considerably. Having examined the balance of payments, the conclusion that emerges is as follows. Singapore is considered to play the greatest role in shipping activity among ASEAN countries, while Malaysia and the Philippines have attained relatively the same level. As for Thailand and Indonesia, they are considered to bring up the rear among this group of countries.

The main objective of this study is to identify whether each ASEAN country bears the burden of maritime costs of the selected commodities on both their exports to and imports from the U. S. Analysis of the said burden follows exactly the same laws which determine the shifting and burden of taxes on commodities. In practice, the exporter can be regarded as bearing freight costs if the delivery price in the importing market is unaffected by any changes in freight rates. Conversely, the importer may be regarded as bearing the cost of transport if the commodity price in the export market would remain the same irrespective to changes in shipping costs. The identification of the shipping burden is carried out by using econometric techniques in estimating the import demand and export supply price elasticities.

The empirical results of the country-by-country basis indicate that a definite conclusion cannot be drawn. The reason is, on the one hand, the number of the selected commodities for both export and import may be too few to draw an overall conclusion of each country and, on the other hand, unsatisfactory cases for each country and commodity are too numerous.

However, in the case of ASEAN as an importer and the U. S. as an exporter, four commodities out of fifteen were significant at ten percent or less tolerance level. It showed that the ASEAN importer bears the shipping costs, and the U. S. exporter bears the shipping costs in one commodity--iron and steel (SITC 282.0) in trading with the Philippines. In the other three commodities--unmilled wheat and meslin, raw cotton, and rice--the ASEAN importer bears the shipping costs. The implications for ASEAN countries are evident. ASEAN consumers demand certain types of American commodities and are willing to bear their shipping costs. ASEAN policy makers might want to reduce these commodities dependency on U. S. by diversifying in their import sources. So as to increase their coverage against exporters and demand lower overall costs. In addition, the ASEAN governments should try to improve port facilities and develop national merchant marines so as to capture some of the shipping activities, especially in importing needed commodities.

In the case of ASEAN as an exporter and the U. S. as an importer, four commodities out of fifteen were statistically significant at ten percent or less tolerance level. It showed that in three cases the

American importer bore the shipping costs, and in one situation an ASEAN country (Indonesia) bore the shipping costs when exporting tin (SITC 687.1) to the U. S. So, in most cases where the commodities are statistically significant, the ASEAN exporter did not bear the shipping costs, rather the American importer did. So, this might suggest that American consumers value these imported commodities so as they are willing to pay a premium for these products. ASEAN exporters, in these cases, might be able to demand higher overall returns, or work to keep this lucrative market out of the reach of other competitors.

Future studies might be able to reach a more comprehensive conclusion if the selection of commodities to include in the study is done differently. In this study commodities are considered only if they are significant to both trading countries--ASEAN and the U. S. A. However, commodities can be selected differently, for example, by examining commodities utilizing SITC at detailed levels, thereby reducing the problem of aggregation of commodity groups. Also, as mentioned earlier, more commodities can be included in future studies, since the number of commodities selected bear inverse relation to the systematic bias evident in the selection process. Moreover, the increased number of commodities selected might enable the researcher to reach both statistical and practical significances. In another word, it is possible to reach statistically significant conclusions linking our hypothesis, but it is of less importance in real life and for policy makers if the number of commodities included in the study are too few.

Another recommendation that might improve similar studies has to do with the time frame of the selected commodities. The present study included annual data on commodities from 1967 to 1979. Going back further and updating the data to present might signal different conclusions. These might make policy makers pursue an alternative trading practice.

BIBLIOGRAPHY

Allen, R. G. D. Mathematical Economics, 2nd ed. London: The Macmillan Press Ltd., 1959.

Allen, R. G. D. and Edward, Ely J. International Trade Statistics. New York: John Wiley and Sons, Inc., 1953.

Arthur D. Little, Inc. and Associated Consultants. Southeast Asian Regional Transport Survey. A research project prepared under the requirement of Asian Development Bank. Singapore: Asian Development Bank, 1972.

Beckerman, W. "Distances and the Pattern of Intera-European Trade." Review of Economics and Statistics. Vol. XXXVIII (February 1956).

Branch, Alan E. The Element of Shipping, 3rd ed. London: Chapman and Hull Ltd., 1977.

Carver, T. N. "The Incidence of Costs." Economic Journal. Vol. XXXIV (December 1924), p. 576.

Chacholiades, M. International Monetary Theory and Policy. New York: McGraw-Hill, Inc., 1978.

Deakin, B. M. and Seward, T. Shipping Conferences. Cambridge: Cambridge University Press, 1973.

Fair, M. L. and William, W. Ernest, Jr. Economics of Transportation. New York: Harper Brothers, 1950.

Finger, J. M. and Yeats, A. J. "Effective Protection by Transportation Costs and Tariffs: A Comparison Magnitude." Quarterly Journal of Economics. Vol. XC (February 1976), pp. 169-176.

Gerachi, V. J. and Prewo, W. "Bilateral Trade Flows and Transport Costs." Review of Economics and Statistics. Vol. LIX (February 1977), pp. 67-74.

Goss, R. O. "U. S. A. Legislation and the Foreign Shipowner: A Critique." Journal of Industrial Economics (November 1963). Reprinted in Goss, R. O. Studies in Maritime Economics. London: Cambridge University Press, 1976.

Goldstain, M. and Khan, M. S. "The Supply and Demand for Exports: A Simultaneous Approach." The Review of Economics and Statistics, No. 2 (May 1978), p. 278.

Grossman, W. L. Ocean Freight Rates. Cambridge: Cornell Maritime Press, 1956.

Johnston, J. Econometric Method, 2nd ed. New York: McGraw-Hill, 1971, c. 1972.

Kendrick, M. S. Public Finance. New York: Houghton Mifflin, 1951.

Kindleberger, C. P. Foreign Trade and the National Economy. New Haven: Yale University Press, 1962.

Koutsogiannis, A. Theory of Econometrics, 2nd ed. London: The Macmillan Press Ltd., 1977.

Laing, E. T. "Shipping Freight Rates for Developing Countries: Who Ultimately Pays?" Journal of Transport Economics and Policy. Vol. XI (September 1977), pp. 262-276.

Lauriat, G. "Liner Shipping: Containerization Is Now Much More Effective." Fareastern Economic Review (February 9, 1979), p. 35.

Linneman, H. An Economic Study of International Trade Flaws. Amsterdam: North Holland Publishing Company, 1956.

Locklin, D. P. Economics of Transportation. Homewood: Richard D. Irwin, Inc., 1972.

Magee, S. P. "Price, Income and Foreign Trade: A Survey of Recent Economic Studies." International Trade and Finance: Frontiers for Research. Edited by P. B. Kenen. Cambridge: Cambridge University Press, 1975.

Marray, T. Trade Preferences for Developing Countries. London: The Macmillan Press Ltd., 1977.

Marx, D., Jr. International Shipping Cartels. Princeton University Press, 1953.

Melachlan, D. L. "The Price Policy of Liner Conferences." The Scottish Journal of Political Economy. Vol. C, No. 3 (November 1963), pp. 323-335.

Moneta, C. "The Estimation of Transport Costs in International Trade." Journal of Political Economy. Vol. LXVII (February 1959), pp. 41-58.

Richards, P. J. "Shipping Problems of Underdeveloped Countries." Oxford Bulletin of Economics and Statistics. Vol. XXIX (August 1967), p. 267.

Sampson, G. P. "Analysis of the Source of Inter-Country Differences in International Transport Costs." Revista Dell Instituto Di Economic Internazionale. Vol. XXXI (August-November 1978), p. 234.

Samuelson, P. A. Economics, 10th ed. New York: McGraw-Hill, 1976.

Shimojo, T. Economic Analysis of Shipping Freights. Kobe: Kobe University Press, 1979.

Thorburn, T. Supply and Demand of Water Transport. Stockholm: Business Research Institute at Stockholm School of Economics, 1960.

Tinberger, J. Shipping the World Economy. New York: Twentieth Century Fund, 1962.

UNCTAD. Level and Structure of Freight Rates, Conference Practices and Adequacy of Shipping Services, TD/B/C.4/38/Rev. 1. New York: United Nations, 1969.

UNCTAD. "Ocean Shipping and Freight Rates and Developing Countries." Financing and Invisibles, Institutional Arrangements, Vol. V, E/Conf. 46/141. New York, 1964.

UNCTAD. "Problems of Shipping and Ocean Freight Rates in the ECAFE Region." Financing and Invisibles, Institutional Arrangements, Vol. V, E/Conf. 46/141. New York, 1964.

United Nations Conference on Trade and Development (UNCTAD). Level and Structure of Freights, Conference Practices and the Adequacy of Shipping Services, TD/B/C.4/38 Rev. 1. New York, 1969.

United Nations Conference of Trade and Development (UNCTAD). Review of Maritime Transport, various issues.

United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP). Review of Development in Shipping, Ports and Inland Waterways. Bangkok, 1980, pp. 57-59.

Yeats, A. J. Trade Barriers Facing Developing Countries. New York: St. Martin's Press, 1979.

APPENDIX A-1

COMMODITY COVERAGE OF ASEAN IMPORTS FROM THE U. S.:

THE PHILIPPINES

Year	SITC 022.2		SITC 121.0		SITC 282.0	
	Q	V	Q	V	Q	V
1967	13777	5809	2236	3239	10722	289
1968	15351	6737	3598	5985	17330	451
1969	9727	4849	4598	7874	18177	476
1970	8700	4738	3322	6199	18277	479
1971	2081	955	2145	4144	17978	569
1972	3566	2398	4310	8170	12514	312
1973	1493	848	4017	9006	12714	317
1974	1845	1008	5104	12751	15699	2167
1975	2698	2080	5373	17673	60475	6225
1976	8032	9793	5917	26407	20956	1441
1977	15714	22305	7010	32239	10090	576
1978	1029	1247	6304	26917	55124	4743
1979	2481	1143	5195	26926	31032	3884

APPENDIX A-2

COMMODITY COVERAGE OF ASEAN IMPORTS FROM THE U. S.:

SINGAPORE

Year	SITC 041.0		SITC 263.1		SITC 712.5	
	Q	V	Q	V	Q	V
1967	16958	1200	2051	965	280	5499
1968	19860	1396	2675	1343	224	4836
1969	26132	1699	1469	720	347	9460
1970	13875	846	997	527	396	12026
1971	12807	821	2405	1404	288	10236
1972	5535	342	865	545	155	7249
1973	48529	6151	5653	4204	415	12621
1974	40946	8189	8340	10480	654	28597
1975	35444	6766	4148	4512	121	6786
1976	41873	7036	6234	8533	311	7251
1977	47355	5366	5346	7944	326	8418
1978	47186	6413	4286	5496	2733	12301
1979	73110	9219	4360	6139	5105	24773

APPENDIX A-3

COMMODITY COVERAGE OF ASEAN IMPORTS FROM THE U. S.:

MALAYSIA

Year	SITC 121.0		SITC 674.1		SITC 712.5	
	Q	V	Q	V	Q	V
1967	4377	8311	1007	129	280	5499
1968	4955	9962	192	25	224	4836
1969	4942	10262	714	104	347	9460
1970	4209	9150	1999	149	188	5302
1971	3980	9142	2013	150	85	2003
1972	2582	6404	162	202	141	2618
1973	3645	9396	618	115	149	4676
1974	5383	15817	928	122	377	14859
1975	3236	12111	59	29	101	4117
1976	3319	14402	218	40	112	5099
1977	5574	24266	142	79	78	3271
1978	4566	26651	143	80	774	3737
1979	5927	34597	143	80	1401	7105

APPENDIX A-4

COMMODITY COVERAGE OF ASEAN IMPORTS FROM THE U. S.:

THAILAND

Year	SITC 561.1		SITC 674.1		SITC 712.2	
	Q	V	Q	V	Q	V
1967	1618	125	2672	331	94	28
1968	1788	137	1831	174	93	27
1969	1990	153	3232	302	81	24
1970	1550	119	2819	2418	121	35
1971	874	54	1835	177	88	26
1972	2243	121	2988	283	83	24
1973	681	56	14760	2207	95	28
1974	2867	366	4470	803	328	95
1975	269	92	44120	5860	115	34
1976	270	92	4113	887	126	37
1977	16535	1621	13129	2089	342	100
1978	7217	1040	12789	2033	595	173
1979	14753	1758	14269	2269	557	162

APPENDIX A-5

COMMODITY COVERAGE OF ASEAN IMPORTS TO THE U. S.:

INDONESIA

Year	SITC 041.0		SITC 121.0		SITC 712.5	
	Q	V	Q	V	Q	V
1967	84052	14149	329	590	45	475
1968	288186	52986	476	860	41	611
1969	316140	56487	412	817	60	1545
1970	374360	61684	261	416	502	11360
1971	252662	42183	180	356	250	6569
1972	282038	52478	470	845	233	4991
1973	95933	33536	548	1036	126	5051
1974	56510	19633	214	491	232	7429
1975	94	57	271	624	120	4665
1976	363760	86627	793	1982	217	11198
1977	250259	70467	688	2105	107	7311
1978	275722	92579	350	1561	359	2336
1979	302371	88418	353	1574	1934	11135

SITC = Standard International Trade Classification

Q = Quantity of commodity imported in metric, tons, number, etc.

V = Value in thousands of U. S. dollars

Source: UN: World Trade Annual, various issues.

APPENDIX B-1

COMMODITY COVERAGE OF ASEAN EXPORTS TO THE U. S.:

THE PHILIPPINES

Year	SITC 061.1		SITC 242.3		SITC 283.11	
	Q	V	Q	V	Q	V
1967	179934	26454	20353	309	14568	14434
1968	140086	20795	9114	188	13194	15258
1969	213417	32764	14990	278	16572	23806
1970	164690	25358	3234	85	16964	23391
1971	387356	62101	2360	58	12352	13041
1972	207510	38423	3320	79	27326	29677
1973	283781	52893	14668	244	17274	28786
1974	173928	62076	4050	124	12923	27206
1975	174772	62376	988	47	11431	14199
1976	233644	58299	2043	105	13650	19295
1977	319103	87250	1574	177	16381	20712
1978	245306	87550	1469	166	11996	28983
1979	248153	88566	658	47	15343	50556

APPENDIX B-2

COMMODITY COVERAGE OF ASEAN EXPORTS TO THE U. S.:

SINGAPORE

Year	SITC 053.6		SITC 075.1		SITC 231.1	
	Q	V	Q	V	Q	V
1967	13290	3409	645	412	173019	72330
1968	16695	4191	1388	791	237557	88844
1969	17227	4437	2054	1355	216160	80844
1970	4288	1129	1327	1195	30664	14613
1971	4164	1088	1012	1034	49931	17108
1972	3251	851	907	801	50136	17318
1973	3842	1072	546	588	40613	23518
1974	3287	1586	653	958	44968	34796
1975	6454	3474	832	1418	36179	22520
1976	5149	2730	1469	2401	24000	19129
1977	4016	2158	563	1175	37188	32067
1978	4223	2268	679	1753	28427	30774
1979	3888	2088	261	586	42570	56537

APPENDIX B-3

COMMODITY COVERAGE OF ASEAN EXPORTS TO THE U. S.:

MALAYSIA

Year	SITC 075.1		SITC 231.1		SITC 652.2	
	Q	V	Q	V	Q	V
1967	645	412	173019	72330	532	155
1968	1288	791	237557	88844	564	164
1969	2054	1355	311354	154327	865	277
1970	3862	3348	249409	109745	1076	325
1971	3117	2839	292235	105413	1561	528
1972	2380	2047	227732	77503	3049	1306
1973	273	267	234807	132687	2991	1461
1974	2542	3979	222787	179223	2788	1730
1975	4606	7129	203429	119292	2528	1303
1976	4094	6221	218677	167698	4117	2608
1977	3199	6662	220110	188420	4209	3034
1978	2362	5254	230852	232595	887	3744
1979	2695	5251	206658	270927	440	2212

APPENDIX B-4

COMMODITY COVERAGE OF ASEAN EXPORTS TO THE U. S.:

THAILAND

Year	SITC 121.0		SITC 231.1		SITC 687.1	
	Q	V	Q	V	Q	V
1967	80	24	8446	3023	16852	54786
1968	256	226	34063	11242	12524	38199
1969	511	292	28293	13133	15302	48647
1970	584	282	27800	11883	16036	57967
1971	116	50	28770	9276	14261	49550
1972	915	546	28980	8219	13000	45242
1973	1651	1009	26306	12567	8479	33276
1974	761	1186	19676	15674	6150	42592
1975	1522	2806	19042	9916	7595	50858
1976	3573	6695	49777	33065	6900	48015
1977	4397	8188	70608	53294	8099	77467
1978	5412	11268	38387	38433	7132	88590
1979	3985	8833	49956	62244	10464	151060

APPENDIX B-5

COMMODITY COVERAGE OF ASEAN EXPORTS TO THE U. S.:

INDONESIA

Year	SITC 121.0		SITC 687.1		SITC 231.1	
	Q	V	Q	V	Q	V
1967	854	630	132	420	195754	61734
1968	328	515	407	1296	182009	53054
1969	260	272	208	745	158425	63565
1970	1533	1798	1382	4985	142232	53874
1971	1166	499	1443	5592	146424	44890
1972	1871	1152	2083	8126	212894	60247
1973	4386	2768	2874	12016	268882	130007
1974	3030	1921	4186	30340	317312	213745
1975	3275	2208	4372	29823	329991	163261
1976	2337	1465	4972	35160	354632	238187
1977	3296	2681	5301	46410	402572	309901
1978	3702	4763	5664	71390	391202	368116
1979	3667	5853	5451	79875	402939	492808

SITC = Standard International Trade Classification

Q = Quantity of commodity exported in metric, tons, number, etc.

V = Value in thousands of U. S. dollars

Source: UN: World Trade Annual, various issues.